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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,547	05/15/2006	Gustav Boehm	510.1154	4668

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EXAMINER	
WANG, EUGENIA	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
08/28/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,547	BOEHM ET AL.	
	Examiner	Art Unit	
	EUGENIA WANG	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 8-19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) 8-19 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 15 September 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 9/15/05.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment

1. The preliminary amendment received September 15, 2005 has been acknowledged.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statements filed September 15, 2005 has been placed in the application file and the information referred to therein has been considered as to the merits.

Specification

4. The disclosure is objected to because of the following informalities: the units of the area in para 0028 line 10 has a typographical error, wherein it should read "mm^2" not 'mm2'.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 19 claims that he MEA comprises a fuel cell. However,

such claim language is unclear, as in a fuel cell is a type of electrochemical cell in which an MEA is a part of. Accordingly, it is unclear and indefinite how a membrane electrode assembly can comprise of a fuel cell.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 8-15, 18, and 19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 00/66652 (Fenton et al.) as evidenced by "Effects of Temperature on Nafion Gas Dryers" (Perma Pure LLC).

As to claims 8, 18, and 19, Fenton et al. teach of a composite membrane structure (p7, lines 19-20). The membrane structure has a porous, polymeric matrix, wherein essentially non-ionically conductive material is embodied (p7, line23 to p8, line 2). It is noted that NAFION is embodied as a polymer-forming binder that is used in the matrix, wherein such a material allows for ion exchange (thus constituting a polymeric electrolyte that fills the pores of the porous, non-ionically conductive material) (p9, lines 4-13; p 11, lines 20-23). It is noted that the polymer matrix (which in one embodiment comprises the non-ionically conductive material) is said to have a melting point from between 160-500°C (p8, lines 12-19). It is either (a) inherent that the electrolyte has a higher melting point or (b) alternately obvious have an electrolyte with a higher melting point than that of the non-ionically conductive material.

With respect to both (a) and (b), it is first noted that Nafion is embodied as the electrolyte material of Fenton et al. (see p9, lines 9-10 of Fenton et al. and para 0044-0045 of the instant application, wherein the characteristic of decomposition point would inherently be the same for each, as they are the same material).

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that both that Nafion is embodied as the electrolyte material of Fenton et al. and the instant application (see p9, lines 9-10 of Fenton et al. and para 0044-0045 of the instant application). Accordingly, the decomposition point of the same material would be the same for the same material (approximately 200 °C, as shown in para 0045 of the instant application). At this point Perma Pure LLC is also used as an evidentiary piece to further support the heat tolerance of Nafion, citing the melting point as being over 200°C, thus showing a melting point wherein a minimum value of 200°C is set (section titled "Maximum Operating Temperature).

The Examiner invites applicant to provide that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Accordingly, with respect to (a), as Fenton et al. specifically embodies (and thus is interpreted to teach) a melting point of the porous polymer matrix 160°C (p 9, lines 12-19), such a characteristic (the polymeric electrolyte having a higher decomposition/melting point (approximately 200°C) than the non-ionically conductive material.

Alternately, with respect to (b), it can be stated that the melting point range embodied by Fenton et al. (between 160-500°C; p8, lines 12-19) does not clearly anticipate the characteristic of a polymeric electrolyte having a higher decomposition point than the non-ionically conductive material (approximately 200°C). First of all, Fenton et al. at the very least would show one of ordinary skill in the art that such things such as stability at high temperatures (and thus melting point, which affects integrity) is result effective variable (p8, lines 5-19). It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize melting point of the polymer matrix in order to ensure a degree of stability at high temperatures, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It has been held that discovering that general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,*105 USPQ 233. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art *unless* there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Furthermore, at the very least Fenton et al. embodies the use of a porous polymer matrix with a melting point of 160°C, wherein one of ordinary skill would have found that the application of such a melting point to the porous matrix structure would have yielded the predictable result of operating in the same manner (as a porous matrix within the fuel cell). In such a manner, the melting point of the porous polymer matrix is rendered obvious (160°C), and thus the polymeric electrolyte has a higher decomposition/melting point (approximately 200°C) than the non-ionically conductive material.

It is noted that that such a structure would inherently include the method of providing all of the elements as listed above (porous, non-ion-conducting material, ion-conducting electrolyte that fill the pores, having the either inherent or alternately obviated characteristic) (as applied to claim 18). Lastly, it is noted that the membrane taught is used in a membrane electrode assembly for a fuel cell (as applied to claims 8, 18, and 19).

As to claims 9-10, Fenton et al. either teach or alternately render obvious the use of a porous polymer matrix (non-ion-conducting material) of a 160°C (p8, lines 12-19).

As set forth within the rejection to claim 1, the decomposition/melting point of Nafion (electrolyte) is inherently approximately 200°C (para 0045 of the instant application; section titled "Maximum Operating Temperature of Perma Pure LLC). Accordingly, using this embodiment, the electrolyte melting point is 40°C higher than that of the porous polymer matrix.

As to claims 11-12 as set forth in the rejection to claim 1 (and reiterated herein) the melting point of the non-ionically conductive material being 160°C is either (a) taught or (b) rendered obvious.

As to (a), Fenton et al. specifically embodies (and thus is interpreted to teach) a melting point of the porous polymer matrix 160°C (p 9, lines 12-19)

Alternately, with respect to (b), it can be stated that the melting point range embodied by Fenton et al. (between 160-500°C; p8, lines 12-19) does not clearly anticipate the claimed range (125-250°C, as in claim 11 and 130-180°C, as in claim 12). First of all, Fenton et al. at the very least would show one of ordinary skill in the art that such things such as stability at high temperatures (and thus melting point, which affects integrity) is result effective variable (p8, lines 5-19). It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize melting point of the polymer matrix in order to ensure a degree of stability at high temperatures, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch,* 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It has been held that discovering that general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in

the art. *In re Aller,*105 USPQ 233. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art *unless* there is evidence indicating such ranges is critical. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Furthermore, at the very least Fenton et al. embodies the use of a porous polymer matrix with a melting point of 160°C, wherein one of ordinary skill would have found that the application of such a melting point to the porous matrix structure would have yielded the predictable result of operating in the same manner (as a porous matrix within the fuel cell).

As to claims 13 and 14, Fenton et al. embody the use of polytetrafluroetylene (PTFE) (wherein a polyethylene is taken to be a polyolefin, an organic polymer) (p8, lines 12-13; p17, lines1-9). Furthermore, although not specifically used in the examples, other organic polymers are embodied, such as polyvinyl fluoride and polyethersulfone, and fluorinated ethylene propylene (p8, lines 12-19). (Thus they are taken to be taught, or at the very least obvious, as the use of any embodied polymer would have yielded the predictable result of operating in the same manner – as a polymer matrix for the membrane.)

As to claim 15, Fenton et al. embody the use of Nafion (perfluorinated sulfonic acid) (p3, line 16; p 17, lines 1-9).

Claim Rejections - 35 USC § 103

7. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fenton et al. as evidenced by Perm Pure LLC, as applied to claim 8, in view of JP 2000-231928 (Terada et al.).

As to claims 16 and 17, it is noted that Fenton et al. teach of an embodiment, as seen in fig. 1, wherein there are protective layers [3,5] that surround the center layer [7] (with the porous polymeric matrix (non-ionically conducting material) and binder (electrolyte) (p16, lines 5-8). The protective material comprises binder (wherein it is noted that NAFION, the electrolyte, is taken to be the binder) (p11, lines 20-22; p16, lines 5-7). Accordingly the composite membrane comprises 3 layers. However, Fenton et al. does not teach that the protective layers have non-ion-conducting material in them (so that the porous, non-ion conducting material is layered, as required by claim 16, specifically 3 layers, as required by claim 17).

However, Terada et al. teach of a polymer electrolyte fuel cell, wherein the electrolyte material (sulfonic acid containing material) is reinforced with polyethylene fiber (abs). The motivation for wanting to reinforce the protective layers of Fenton et al. with polyethylene fibers, as taught by Terada et al. is in order to lessen resistance and to improve dimensional stability (para 0010). Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to include the reinforcing materials of Terada et al. in the protective portion of Fenton et al. in order to further improve the mechanical stability of the membrane as well as to lessen resistance.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUGENIA WANG whose telephone number is (571)272-4942. The examiner can normally be reached on 7 - 4:30 Mon. - Thurs., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. W./
Examiner, Art Unit 1795
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/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795